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§ 2. **Bryological Notes and Criticisms** by C. F. AUSTIN,
*suggested by the careful study of a paper entitled "Descriptions of
 some New Species of North American Mosses; by Leo Lesquereux
 and Thomas P. James. (With a Supplement by W. P. Schimper.)"*
Proc. of the Amer. Acad. of Arts and Sciences, Boston, 1879, pp.
133-141.

First there is an introduction, from which we quote:—"On a recent visit by Mr. James to Europe, he took with him not only specimens of the species here described, but also of many of those recently described in the Scientific Journals of this country, for the purpose of critically examining the whole in co-operation with Prof. W. P. Schimper, of Strasburg. This justly celebrated bryologist has cordially given his assistance in this review, and therefore secured to the descriptions of our species a higher degree of authority." Then follows the description of 17 species, 14 of which are claimed to be new. Upon reading the introduction, our expectations were raised to a high pitch, and we were prepared for a rich feast of bryological novelties. How we fared the sequel will show.

(1.) *Sphagnum Garberi*, L. & J. Hab. Florida, *Garber*.—The diagnosis of this "new" *Sphagnum*, except where it is manifestly wrong, is so very like Sullivant's description (*Icones* p. 5), of *Sph. humile*, SCHIMP., that there cannot be the slightest doubt of their identity. This view is fully confirmed by the examination of an authentic specimen kindly sent me by Mr. James, as well as of specimens collected in Florida by Capt. Donnell Smith and myself. Furthermore: Having seen many large beds of *Sphagnum rigidum*, SCHIMP., and examined scores of specimens, including numerous forms, all the way from British America in the North, to the Everglades of Florida in the South, it is equally plain to me that *S. humile* is only a local form of *S. rigidum*. The small form (*S. humile*, S. & L. Exsic. ed. 2 n. 18, and AUST. Musc. Appalach. n. 8), which abounds from New Jersey to Georgia, is characterized by nothing worthy of note except its smaller size. In Florida it runs into the *var. humile*. Any one who has watched the growth of *Sphagna* in their native beds for a succession of years, must know that some of the characters emphasized by authors are of the least possible account in separating them into species; e. g., the same bed may be all the true *Sph. cuspidatum* one year and all the true *Sph. recurvum* the next! clearly proving the latter to be a mere state of the former. This year a bed may be all the true *Sph. cymbifolium*, and next year all the *var. squarrosulum*, &c. The most opposite extremes of those characters which are plainly visible to the naked eye are apt to occur in the same species. An abundance of heat, light and moisture producing results very different from those produced by a deficiency of the same. *Sphagnum rigidum* varies considerably, yet I have always found it one of the easiest of species to determine. Probably the *var. humile* differs more from the type than any other of its forms. Yet its differences are plainly caused by the remarkably warm and moist climate in which it grows. In all the forms the margins of the branch-leaves are usually beset with minute blackish

bristle-like teeth, as in *Sph. cymbifolium* and its allies. They are also very narrowly margined, and their areolæ are furnished with largish more or less unequal indistinct pores. However, in the description of *Sph. Garberi*, both these last characters are erroneously said to be wanting. Furthermore, the chlorophyllose cells are said to be furnished with "numerous pores." Of course, this is an optical illusion; for pores belong only to *areolae* or air-cells. "The inflorescence," it is said, "is dioecious." This needs confirmation, for four reasons: 1. No part of the male plant is described. 2. All of the numerous specimens I have seen, if mature, are fertile,—this could hardly happen were the plant dioecious. 3. All the other forms of *Sph. rigidum* are monoecious. The 4th reason will become apparent to the reader further on in this review. [I have not searched for the male inflorescence because my specimens were all collected when the fruit was mature, by which time the antheridia in all Sphagna, (grown in warm climates at least) have totally disappeared.]

(2.) *Archidium longifolium*, L. & J. Hab. Florida. *Garber*.—I have seen no authentic specimens, the one sent me by Mr. James under this name being *A. Ohioense*, SCHIMP. But the perusal of the diagnosis and the habitat given, leaves no doubt of its being identical with *A. Lescurii*, AUST., first described in this Journal for Mar., 1877, (Vol. VI., p. 144). The authors affirm that the capsule and spores are as in *A. alternifolium*, BRID. Qualifying this remark slightly, they should have so extended it as to include all the other species of the genus; and they might very properly have included the calyptra in the same category with the capsule and spores. (In 1868 I described and sketched this organ in a letter to Mr. Sullivan. I also described it in this Journal Vol. V., n. 7, p. 30, but to this day I am not aware that any one except myself and Mr. Rau ever saw it!) They also say "Antheridia 2." I have found as many as eight in one cluster.

(3.) *Bruchia flexuosa*, SCHWAEGR.—"Stems a half-inch or more in length. Inflorescence synoecious (*flos bisexualis*). "I have a large quantity of specimens of all the species of *Bruchia* which are common from New Jersey to Florida, all of which I have examined very carefully; but I never saw one with such long stems (exclusive of the leaves), nor did I ever see a bisexual flower except upon the minute *B. Caroliniana*, AUST., and even here the inflorescence is often autoicous.

(4.) *Bruchia Sullivanti*, AUST.—This is said to be autoicous. "Inflorescence monoecious, male flower gemmaeform," and in the very next line the authors quote Sullivan's *Icones*, T. 13, to substantiate the statement; yet it is both correctly figured in the *Icones* and described by me in this Journal, Vol. VI., n. 27, p. 143, as paroecious! (antheridia naked in the axil of a single comal leaf.) I have never seen autoicous inflorescence in any species that could be taken for either *B. flexuosa* or *B. Sullivanti*, except in extremely rare instances, all of which will be mentioned further on.

(4 b.) *Bruchia nigricans*, AUST. (It should read *B. nigrescens* (S. & L. AUST.; *B. flexuosa*, var. *nigrescens*, S. & L., an error of mine.)—Our authors consider this a "mere casual var. of *B. Sullivanti*,"

which may be true, but I never saw that species with such large spores. The dark color of the capsule is no doubt properly attributed by them to the plants having grown in a moist depression on the top of a mountain. The inflorescence is paroecious, and not autoicous as we are led to infer. My specimen (S. & L. Exsic, Ed. 2, n. 42) comprised only a few plants, but these were all very perfect !

No. 41 of the work just referred to, comprises three distinct forms, apparently collected in as many different places, and represents two if not three distinct species; as follows :—*B. Sullivanti* with paroecious inflorescence, medium-sized spores and smooth leaves ; *B. Donnellii*, AUST. with similar inflorescence, large spores and papillose leaves ; and *B. flexuosa*, SULLIV., Mosses of the U. S., with autoicous inflorescence, minute spores and smooth leaves. It is probable the last mentioned is only a form of the first. I have never seen it from any other source. Its exact habitat is unknown.

(5.) *Bruchia brevicollis*, L. & J. Hab. S. Car. Ravenel.—The specimens sent to me by Mr. James under this name I had before from Prof. Ravenel, who informed me that he had never collected it but once. Sullivant also had it from Ravenel, and the figures in his Icones Suppl. t. 15, *Bruchia Beyrichiana*, HAMPE., were undoubtedly drawn from it. The inflorescence of *B. brevicollis* is not given, but we are erroneously led to infer that it is autoicous.

Having seen the specimens of Ravenel and Vasey, from which the description and figures in the Icones Suppl. were drawn, I have no hesitation in saying that they all belong to *B. Sullivanti*. Ravenel's represent imperfectly developed single plants, which one may find occasionally in colonies of *B. Sullivanti* ; or sometimes (rarely) growing separately. The calyptra is not longer than in the usual forms, but the capsule being shorter makes it appear so. Inflorescence, form and texture of the leaves, spores, &c., precisely as in the fully developed plants with which they grow. Vasey's Illinois specimens belong to very immature typical *B. Sullivanti* ! All have paroecious inflorescence. Occasionally a plant may be found with a stunted appearance, a small short columned capsule and a large gemmaeform male flower, all of which are abnormal conditions ; while in all other respects the same plant will be normal.

(6.) *Weisia longiseta*, L. & J. Hab. Florida, W. L. Foster.—This is included in *W. viridula*, var. *australis*, AUST. Exsic. Suppl. No. 466, and appears to be a common form of this cosmopolitan and variable species in the extreme South. It is said to be dioecious. The remark, "It cannot be taken for a form of *W. viridula*, BRID.," I am obliged to dissent from ; for Donnell Smith and myself not only collected it plentifully in Florida, but also forms connecting it with the shorter pedicelled form with somewhat shorter less fissured peristomal teeth, which appears to be the common southern form of the species, occurring as far north at least as New Jersey.

(7.) *Weisia Wolfii*, L. & J. Hab. Canton, Ill. J. WOLF.—This is also said to be dioecious. It is another form of *W. viridula*, larger and a little more fully developed than the form given in Musc. Appalach. Suppl. n. 465, under *Weisia Rauai*, (vide this Jour., Vol. V., p. 20, for description). In fact Mr. Rau never sent me the delicate gym-

nostomous form which bears his name but once; but has frequently sent specimens from the same spot collected since, which are almost identical with Mr. James' specimens—*monoecious* inflorescence and all. But I find no male plants in specimens sent by Mr. Wolf, which are nearly identical with No. 68 of Musc. Appalach. The forms of this species are all transient, as any one must know who has watched it grow. I have found its widest possible extremes growing from the same patch during but two successive years.

The inflorescence in this species, usually autoicous, is often obscure. I have often examined specimens in which I could find no male flowers, but have no recollection of ever seeing a specimen that contained no female flowers. (No. 69 of Musc. Appalach, forms no exception to this rule, for it plainly belongs to some other species. It appears to be a *Gymnostomum*.)

Weisia viridula, BRID., not only includes both the foregoing "new species," and both *W. (Gymnostomum) Rauai* and *Brandegei*, AUST., but several other about equally well characterized forms, which I am not aware have yet been described as new; and the characters in which *W. mucronata*, BRUCH, coincides with one or another of the forms of *W. viridula*, are too striking for me to accept it as a distinct species; although it is so regarded, I believe, by all the eminent authorities of Europe. In matters of this kind I have invariably found Nature to be the best authority.

(8.) *Ptychomitrium (Notarisia) pygmaeum*, L. & J. Hab. Near the Neosho River, Kansas, and at Bolivar, Missouri, *E. Hall*.—Not being able to get an authentic specimen from Mr. James, I proceeded to study carefully the description; and soon became so strongly impressed with the idea that it was at most only a form of *Pt. incurvum*, SCHWGR., that I wrote to Mr. Hall for samples of the original specimens. He generously responded with two specimens from West Mo. One from Vernon Co., which proved to be true *Pt. incurvum*, and the other from Bolivar, one of the localities given for the new moss. This is not smaller than the true *Pt. incurvum*, as it occurs in this region (Closter, N. J.), *nor are the leaves different in a single, most minute particular*; but the pedicels are a little shorter and the capsules darker and more solid, narrower, and usually more acute at the base. All the capsules are immature and shrivelled, and have a more or less diseased appearance. Even after long soaking I found it impossible to swell them out; or to remove an operculum without injuring the peristome, which, so far as I could see, is not different from the imperfectly developed peristome of the typical plant. The same is true of the annulus. As for the "marked neck of the capsule extending one-third its length;" I find it to be but a trifle more marked than I have usually seen it in immature capsules of typical *Pt. incurvum*; in fact, upon long soaking and under slight pressure, it is, in the best developed capsules, not more marked than it is shown to be in Fig. 2 of Sullivan's Icones, T. 39. The Neosho River specimens, received since the above was written, differ from the last only in having all the capsules very old, and the calyptras all very young,

(9.) *Fissidens Garberi*, L. & J. Hab. on the bark of trees, Florida. *Garber*.—I have not been able to secure a specimen from

Mr. James; but in Mar. 1877, Capt. Donnell Smith sent me from the Indian River, Florida, a little *Fissidens* which I described at the time as new, and sent a specimen to Mr. James. He replied that he already had it diagnosed and ready for publication, under the name of *Fissidens Garberi*; so there can be no doubt of the authenticity of my specimens. I have since found it myself in southwest Florida, on shells, rotten wood and roots of trees. It also occurs on coquina rocks. Here again the authors are at fault with their inflorescence. They say "flos bisexualis." I have invariably found the species pseudo-dioecious, e. g., as in *F. obtusifolius*, WILS.

(10.) *Fissidens Floridanus*, L. & J. Hab. Florida, *Garber*.—I have not been able to get any clue to this moss. Mr. James informs me that he has none of it; having left his only specimen with Prof. Schimper. We are not told whether it grows on the ground or elsewhere. The leaf is said to have a "large pellucid border." This character belongs to but two species in this country, known to me, and both of them are common in Florida. They are *F. decipiens* and *F. adiantoides*,—the former dioecious, the latter monoecious:—(both have lateral inflorescence.) In one place the inflorescence is said to be "monoecious, with the male fls. terminal on longish lateral branches, and the female fls. axillary on the middle of the stem." In another place, "the species," it is said, "is related to *F. osmundioides* HEDW. [which is dioecious!] by its monoecious, terminal inflorescence." In one place the capsule is said to be oval-oblong and cernuous; in another "oblong-cylindrical and curved." Upon the whole, the ambiguity of the description, together with the paucity of the specimens, would seem to exclude this "new moss" from the category of things having an actual existence.

(11.) *Cryphaea pendula*, L. & J. Hab. Florida, *J. D. Smith*. (*C. glomerata*, var., AUST., Musc. Appalach. Suppl. n. 526.)—In the first place I believe the specific name is not well chosen; for, if I am not greatly mistaken, the plant is the reverse of pendulous. In the second place, excepting that the leaves towards the ends of the usually longer stems are longer acuminate, I am unable to find any difference between this and the common plant which is sometimes found as far north as New Jersey, and which is known as *Cryphaea glomerata*, SCHIMP. In the form of the ordinary stem-leaves, areolation of the same, perichaetial leaves, capsule, calyptra, operculum, annulus, peristome, spores, and in the ramification, I am unable to find a shadow of difference between them. In this case the authorities upon *Cryphaea glomerata* appear to have been sufficiently consulted; not so the typical plant itself!

(12.) *Hypnum Watsoni*, L. & J. Hab. Colorado, *Watson*.—There is a more accurate description of this species in the Bryology of the 49th, paralell, by Mitten, under the name of *Hyp. plicatile*. (1864.) It is undoubtedly *Hyp. Heufleuri*, JURATZKA. (1861.) (compared with a specimen from Schimper kindly furnished by Mr. James.) It is also *H. revolutum*, LINDB., MS. & *H. recurvo-marginatum*, n. sp.? AUST. MS. I have many specimens of it from Colorado, Oregon and Brit. Columbia. It also occurs in the high latitudes and alpine regions of Europe. The most striking feature

of the species is the (usually) broadly revolute margin of the leaf, from base to point. The capsule is curved in the middle from an erect base, the operculum is shortly conic and very obtuse. The leaves are often serrulate at the apex, shortly bicostate, and furnished with a larger or smaller, usually not well defined patch of very short and minute, more or less obscure cells at the basal angles. In mode of growth, ramification, and in the reticulation of the leaves it is variable. I have what appears to be a form of this species also from Monterey, Mexico.

(13.) *Hypnum Alaskanum*, L. & J. Hab. Alaska, *W. H. Dall*.—A fine species and deserving a more complete description than our authors have given it. They describe it by now comparing and now contrasting it with *Hypnum Schreberi*, WILLD, to which they in the main liken it. The form of the leaf, excepting that it is not involute-acuminulate at the apex, is much as in that species; but in size, facies, closely pinnate ramification, texture of the leaves, presence of paraphyllia on the stem, &c., it is totally distinct, being a true *Pleurozium*, as the following description from specimens communicated by Mr. James will show:

[**Hylocomnium (Pleurozium) Alaskanum.**—*Hypnum Alaskanum*, L. & J. in Proc. Amer. Acad., Boston, for 1879, p. 139.—Stems closely pinnately and bipinnately branched, and, as well as the branches, densely paraphyllate, about $\frac{1}{2}$ '— $\frac{3}{4}$ ' wide; branches widely spreading, (the ramuli very short and mostly divaricate), subdepressed, obtusish or acutish. Paraphyllia much divided, the divisions capillary. Stem-leaves large, broadly ovate, rotundate-obtuse, concave, smooth, of a firm texture, even, or here and there sulcate-striate, particularly near the lower margins, which are usually (either broadly or narrowly) revolute and often apparently solid, shortly and obscurely somewhat bi-pluricostate; the margins remotely serrate-denticulate; ordinary cells elongated, linear, subvermicular, remarkably obtuse at both ends, more or less discrete, opakish,—the interstices more or less confluent; the basal cells somewhat widened, but scarcely shorter, solid, dark fulvous, not well defined; both in the centre and at each margin, where they are the most conspicuous, these fulvous cells extend upwards for a longer or shorter distance, often forming costæ-like striæ. Branch-leaves much smaller and less denticulate, otherwise similar. Inflorescence and fruit not seen. Nearest to depauperate forms of *H. splendens*, (HEDW.) from which, however, it is readily distinguished by its more uniform less compound ramification, obtuse smooth more shortly bicostate more opaque less serrulated leaves, with more obtuse and more discrete cells, &c.]

(14.) *Ephemerum spinulosum*, SCHIMP.—The remarks here made by Schimper, as well by L. & J. upon both this species and *Ephemerum crassinervium*, SCHWGR., although true enough upon the whole, throw no new light upon these two protean mosses. I have spent hour after hour vainly trying to arrange my specimens and to separate them into intelligible forms, and should hail with delight a disertation upon them that would point me the way out of the difficulty.

(15.) *Systegium erythrostegium*, BRUCH & SCHIMPER, *Phascum*

crispum, var. *rostellatum*, H. & W., in Drummond's Southern Mosses No. 10. Hab. New Orleans, Drummond.—I have not been able to see Drummond's No. 10, but I have a *Systegium* from the same region, collected by Hall, Mohr and Featherman, which appears to be not rare throughout the Gulf region, and the only species yet found there; for the diagnosis of Bruch and Schimper describes it with sufficient accuracy. It is *Astomum* (*Systegium*) *Ludovicianum*, SULLIV., Icones, T. 12. The male flower is terminal, becoming lateral, as B. & S. describe it; or probably in rare instances becoming dichotomal as shown in the Icones.

(16.) *Orthotrichum brachytrichium*, SCHIMP.; *O. obtusifolium*, Drummond's Mosses of Brit. Amer., n. 157. Hab. Canada East to the Rocky Mts.—There is some mystery here which I am unable to solve. Drummond's moss is identical with the European *O. obtusifolium*, SCHRAD., which is most accurately described in Schimper's Synopsis, Ed., 1860, p. 263. It is also identical with the numerous specimens which I have from the same region, collected chiefly by Fowler and Macoun. Schimper describes it as having "apiculate acutely carinate most minutely papillose leaves, with the margins subrevolute-reflexed, inflorescence monoecious, calyptra pale straw-colored, and with a few short hairs on its apex." I find the leaves to be obtuse, not carinate, mostly clothed with large papillae, inflorescence dioecious, calyptra with a pale base, fuscous brown above, epilose, and papillose-tuberculate. I have picked from among some *Orthot. Ohioense*, collected by myself in the Jordansville Swamps, N. Y., about a half-dozen sterile stems of this species. Some of these have the leaves all obtuse, more have them nearly all acute or acutish, and one or two of the stems have the upper leaves somewhat hyaline-apiculate; otherwise they are normal. I have not seen acute leaves on any other of my specimens. There is a depauperate form of this species, always sterile, found on shade trees, old stone fences and limestone rocks, as far south as New Jersey.

(17.) *Plagiothecium pseudo-Silesiacum*, SCHIMPER, *Hypnum Silesiacum*, H. & W., in Drummond's Southern Mosses No. 111. Hab. Near St. Louis.—I have not been able to get a fragment of No. 111, from this collection. But since nothing answering to Schimper's description, except *Plagioth. striatellum* (BRID.), and *Pl. turfaceum*, LINDB., appears to have been found in North America, at least since Drummond's time; there can be little if any doubt of its being one or the other of these widely distributed species. The basal cells of the leaf not being described, leaves some doubt as to which of the two it belongs; but since the description fits the former in some respects exactly, while it fits the latter only in a general way, and since the former is the more southern specie, it becomes quite apparent that the moss above referred to is only *Pl. striatellum*. (*Pl. Muhlenbeckii*, BR. EU.)

§ 3. A New Fungus.—By W. R. GERARD.

Simblum rubescens, nov. sp.—Volva subglobose, whitish, bursting irregularly into three or four lobes, which soon become very remote from the stipe. Receptacle depressoglobose, very slightly broader than the stipe, cancellate; branches crisped, flattened, and with sinu-